

IN THE CLAIMS

Please amend the claims as follows.

1. (Currently Amended) A method for printing a document in a data communications system using a, ~~the system including a processing unit including a printer client (1001) and a printer including a printer server (1002), the processing unit and the printer using for communication between each other a wireless printer protocol, the Bluetooth protocol stack and air interface, the Bluetooth protocol stack including a wireless printer protocol and a Logical Link Control and Adaptation Protocol (L2CAP), the method including~~ comprising the steps of:

establishing (701) a bi-directional wireless asynchronous connection-less (ACL) connection between ~~the~~ a processing unit including a printer client and ~~the~~ a printer including a printer server, wherein establishing the ACL connection comprises ~~by means of the wireless printer protocol calling the L2CAP requesting the ACL connection and the L2CAP creating the ACL connection;~~

establishing (702) a connection for one or more ~~print jobs~~ print jobs between the printer client (1001) and the printer server (1002);

negotiating (703) configuration parameters between the printer client (1001) and the printer server (1002);

sending (704) keep alive messages ~~frequently~~ repeatedly from the printer client (1001) to the printer server (1002) and from the printer server (1002) to the printer client (1001), the keep

5. (Currently Amended) The method according to claim 4, wherein the step of obtaining ~~[[an]] the~~ address of ~~[[a]] the~~ printer ~~is performed by~~ comprises using ~~[[the]] a~~ Device Discovery Protocol.

6. (Currently Amended) The method according to claim 5, wherein ~~the~~ establishing ~~[[a]] the~~ connection for ~~the~~ one or more print jobs ~~printjobs is performed by~~ comprises sending a connection request message (1003) from the printer client (1001) to the printer server (1002).

7. (Currently Amended) The method according to claim 6, wherein ~~the~~ establishing ~~[[a]] the~~ connection for ~~the~~ one or more print jobs ~~printjobs is performed by~~ further comprises responding ~~upon the request whether the connection was successful or not, to the~~ connection request message in a response message (1004) sent from the printer server (1002) to the printer client (1001) regardless of whether the connection is successful.

8. (Currently Amended) The method according to claim 1, wherein the step of negotiating ~~the~~ configuration parameters (503), between the printer client (1001) and the printer server (1002), ~~is performed by~~ comprises the printer client (1001) requesting configuration in a configuration request message (1101) sent to the printer server (1002), the configuration request message including no new options ~~[[.]]~~ if ~~the~~ printer client (1001) uses default values.

9. (Currently Amended) The method according to claim 1, wherein the step of negotiating the configuration parameters (503), between the printer client (1001) and the printer server (1002), ~~is performed by~~ comprises the printer client (1001) requesting configuration in a configuration request message (1103) sent to the printer server (1002), the configuration request message including a suggestion of configuration options.

10. (Currently Amended) The method according to claim 9, wherein said configuration request message is responded to by the printer server (1002) in a response message (1102, 1104, 1106) indicating whether the configuration options in the configuration request message are supported by the printer server (1002) ~~or not~~.

11. (Currently Amended) The method according to claim 10, ~~including the further step, if the configuration request responds failure;~~ further comprising the step of:

sending a further configuration request message (1105, 1109) from the printer client (1001) to the printer server (1002) if the configuration options are not supported by the printer server, the further configuration request message including a suggestion of further configuration options which differs from the earlier suggestion ~~s of configuration options~~.

alive messages identifying whether the connection between the printer client and the printer server remains established;

starting (705) a print job;

sending (706) the print data from the processing unit to the printer;

stopping (707) the print job; and

closing (708) the ACL connection between the processing unit and the printer.

2. (Currently Amended) The method according to claim 1, further comprising the further step of ~~to be taken before the step of establishing (701) a bi-directional wireless ACL connection:~~

selecting ~~[[a]] the printer among~~ from a number of available printers before establishing the ACL connection.

3. (Currently Amended) The method according to claim 2, wherein the step of selecting ~~[[a]] the printer is performed by~~ comprises using ~~[[the]] a~~ Device Discovery Protocol.

4. (Currently Amended) The method according to claim 1, further comprising the further step of ~~to be taken before the step of establishing (701) a bidirectional wireless ACL connection:~~

obtaining an address of ~~[[a]] the printer~~ before establishing the ACL connection.

12. (Currently Amended) The method according to claim 1, further comprising the ~~further step of to be taken after the step of negotiating configuration parameters~~ (503):

sending a set attribute request message (1201) from the printer client (1001) to the printer server (1002) after negotiating the configuration parameters, the set attribute request message comprising a coding table concerning a negotiated coding type.

13. (Currently Amended) ~~Method~~ The method according to claim 12, further comprising the ~~further~~ step of:

~~the printer server (1002) loading the coding table at the printer server by means of said received set attribute request message (1201).~~

14. (Currently Amended) ~~Method~~ The method according to claim 13, further comprising the ~~further~~ step of:

sending a response to the set attribute request message ~~whether the loading of the coding table was successful or not in a message (1202)~~ from the printer server (1002) to the printer client (1001) regardless of whether the loading was successful.

15. (Currently Amended) The method according to claim 1, wherein a keep alive timer is implemented in the printer client (1001) and in the printer server (1002), and the method further comprises ~~comprising~~ the ~~further~~ step of:

starting the keep alive timer at one of the printer server and the printer client each time a valid message is received from the ~~remote endpoint~~ other of the printer server and the printer client.

16. (Currently Amended) The method according to claim 15, ~~wherein said keep alive timer expires~~, further comprising the ~~further~~ step of:

closing the connection between the printer client and the printer server when the keep alive timer expires.

17. (Currently Amended) The method according to claim 1, wherein the step of starting ~~[[a]] the print job (505) is performed by~~ comprises the printer client (1001) ~~requests requesting that the printer server (1002) to start~~ [[a]] the print job printjob in a request message (1305).

18. (Currently Amended) The method according to claim 17, wherein said ~~start printjob~~ request message (1305) is received and confirmed by the printer server and (1002), ~~the a confirmation is sent in a response message (1306) to the printer client (1001).~~

19. (Currently Amended) The method according to claim 1, wherein the step of sending the print data from the processing unit to the printer (506), ~~is performed by~~ comprises ~~requesting the printer server (1002) to~~ sending the print data sent in a number of print data request messages (1307, 1308, 1310).

20. (Currently Amended) The method according to claim 19, further comprising the further step of ~~to be taken after the printer server (1002) have received a previous decided number of print data request messages:~~

sending an acknowledgement message (1309) from the printer server (1002) to the printer client (1001) after the printer server has received a predetermined number of the print data request messages.

21. (Currently Amended) The method according to claim 1, further comprising the further step of ~~to be taken if the printer runs out of paper:~~

indicating that the printer is out of paper in a message (1406) sent from the printer server (1002) to the printer client (1001).

22. (Currently Amended) The method according to claim 21, further comprising the further step of ~~to be taken when the printer is refilled:~~

indicating that the printer is refilled with paper in another message (1407) sent from the printer server (1002) to the printer client (1001).

23. (Currently Amended) The method according to claim 22, further comprising the further step of ~~to be taken after the printer client (1001) has received an indication message (1407) that the printer is refilled:~~

continuing the printing ~~process~~ by continuing to send print data request messages ~~, (1408, 1409)~~ to the printer server starting with the print data request message subsequent to ~~[[the]]~~ a last received print data acknowledgement message (1405).

24. (Currently Amended) The method according to claim 1, ~~wherein the ACL connection is disconnected during printing, the method~~ further comprising the ~~further~~ step of:

stopping ~~[[the]]~~ a keep alive timer when the ACL connection is disconnected during printing.

25. (Currently Amended) The method according to claim 24, ~~wherein a new ACL connection is created~~ further comprising the ~~further~~ step of:

requesting a reconnection of ~~[[the]]~~ a session defined by ~~[[the]]~~ a session identifier in a message (1506) sent from the printer client (1001) to the printer server (1002).

26. (Currently Amended) The method according to claim 25, further comprising the ~~further~~ step of:

sending a response according to whether the reconnection is granted ~~or not~~ in a response message (1507) from the printer server (1002) to the printer client (1001).

27. (Currently Amended) The method according to claim 26, further comprising the further step of ~~to be taken after the printer client (1001) has received a granted reconnection response:~~

continuing the printing ~~process~~ by continuing to send print data request messages ~~(1508, 1509)~~; after the printer client receives a granted reconnection response starting with the print data request message subsequent to ~~[[the]]~~ a last received print data acknowledgement message ~~(1505)~~.

28. (Currently Amended) The method according to claim 1, wherein the step of stopping the print job ~~(707)~~, ~~is performed by, after sending all data to be printed to the printer server (1002)~~; comprises sending a request to stop the print job ~~printjob~~ in a message ~~(1311)~~ from the printer client ~~(1001)~~ to the printer server ~~(1002)~~.

29. (Currently Amended) The method according to claim 28, further comprising the further step of: ~~to be taken after the printer server (1002) has received a request to stop the printjob;~~

sending a response message ~~(1312)~~; comprising a confirmation ~~that this is apprehended,~~ from the printer server ~~(1002)~~ to the printer client ~~(1001)~~ after the printer server receives the request to stop the print job.

30. (Currently Amended) The method according to claim 1, wherein the step of closing the ACL connection between the processing unit and the printer (708) ~~is performed by~~ comprises the printer client (1001) requesting a disconnection of ~~[[the]]~~ a session defined by ~~[[the]]~~ a session identity in a message (1313) sent to the printer server (1002).

31. (Currently Amended) The method according to claim 30, wherein the printer server ~~responses to~~ indicates whether the disconnection was granted ~~or not~~, in a response message (1314) sent from the printer server (1002) to the printer client (1001).

32. (Currently Amended) The method according to claim 1, further comprising the ~~further step of~~ to be taken after the step of closing the connection between the processing unit and the printer (708):

stopping the sending of the keep alive messages after the ACL connection is closed.

33. (Currently Amended) A computer program product ~~directly~~ loadable into ~~[[the]]~~ an internal memory of a digital computer within at least one of a processing unit ~~[[or]]~~ and a printer in a communication system, the computer program product comprising ~~[[the]]~~ software code portions for performing the steps of claim 1 ~~[[,]]~~ when said product is executed ~~run on a computer~~.

34. (Currently Amended) A computer program product stored on a computer usable medium, the computer program product comprising readable program code for causing a computer within at least one of a processing unit [[or]] and a printer in a communication system [[,]] to control an execution of the steps of claim 1.

35. (Currently Amended) An entity (501) ~~included~~ in a [[P]] processing unit (402), the entity comprising: ~~includes~~

a Bluetooth protocol stack comprising a Logical Link Control and Adaptation Protocol (L2CAP) ~~characterised in that the Bluetooth protocol stack further comprises~~ and a wireless printer protocol, [[said]] the wireless printer protocol comprising a printer client ~~which~~ capable of communicating ~~es (803) with a printer server, included in a printer; (403), by means of the Bluetooth protocol stack and air interface, the entity (501) further comprises:~~

an establishing device (502) arranged for establishing a bi-directional wireless asynchronous connection-less (ACL) connection to the printer (403) by calling the L2CAP requesting the connection;

an establishing device (503) arranged for establishing a connection for one or more print jobs between the printer client and the printer server; ~~print jobs~~

a negotiating device (504) arranged for negotiating configuration parameters with [[a]] the printer server ~~within the printer (403);~~

a sending device (509) arranged for sending keep alive messages ~~frequently~~ repeatedly to the printer server, the keep alive messages identifying whether the connection between the printer client and the printer server remains established;

a starting device (513) arranged for starting a print job;

a sending device (515) arranged for sending [[the]] print data to the printer server;

a stopping device (520) arranged for stopping the print job; and

a closing device (~~522~~) arranged for closing the ACL connection between the processing unit (~~402~~) and the printer (~~403~~).

36. (Currently Amended) The entity (~~501~~) according to claim 35, ~~characterized by comprising wherein the establishing device for establishing the connection for the one or more print jobs comprises~~ a sending device arranged for sending a connection request message from the printer client to the printer server.

37. (Currently Amended) The entity (~~501~~) according to claim 35, wherein ~~when negotiating configuration parameters, the printer client~~ the negotiating device uses default values when negotiating the configuration parameters , ~~characterized by comprising and comprises~~ a sending device (~~505~~) arranged for sending a configuration request message to the printer server, the configuration request message including no new options.

38. (Currently Amended) The entity (~~501~~) according to claim 35, ~~characterized by comprising wherein the negotiating device comprises~~ a sending device (~~506~~) arranged for sending a configuration request message to the printer server, the configuration request message including a suggestion of configuration options.

39. (Currently Amended) The entity (501) according to claim [[35]] 38, ~~characterized by comprising~~ wherein the negotiating device further comprises a sending device (507) arranged for sending a further configuration request message to the printer server, the further configuration request message including a further suggestion of configuration options which differs from the earlier suggestion ~~s of configuration options~~.

40. (Currently Amended) The entity (501) according to claim 35, ~~characterized by comprising~~ wherein the entity further comprises a sending device (508) arranged for sending a set attribute request message to the printer server, the set attribute request message comprising a coding table concerning a negotiated coding type.

41. (Currently Amended) The entity (501) according to claim 35, ~~characterised in that~~ wherein a keep alive timer (510) is implemented in the printer client.

42. (Currently Amended) The entity (501) according to claim 41, ~~characterized by comprising~~ wherein the entity further comprises a starting device (511) arranged for starting the keep alive timer (510) each time a valid message is received from the printer (403).

43. (Currently Amended) The entity (501) according to claim 42, ~~characterized by comprising~~ wherein the entity further comprises a closing device (512) arranged for closing the connection between the printer client and the printer server [[,]] when the keep alive timer (510) expires.

44. (Currently Amended) The entity (501) according to claim 35, ~~characterized by comprising~~ wherein the starting device comprises a sending device (514) arranged for sending a request message to the printer server, the request message comprising a request to start [[a]] the print job ~~printjob~~.

45. (Currently Amended) The entity (501) according to claim 35, ~~characterized by comprising~~ wherein the sending device for sending the print data to the printer server comprises a sending device (516) arranged for sending a number of print data request messages to the printer server, the print data request messages comprising the print data.

46. (Currently Amended) The entity (501) according to claim [[35]] 45, ~~wherein a refill of paper has broken a printing process, characterised by comprising~~ the entity further comprises a continuing device (517) arranged for continuing the printing ~~process~~ when the printing is interrupted by a refill of paper at the printer, the printing continued by continuing to send the print data request messages to the printer server [[,]] starting with the print data request message subsequent to [[the]] a last received print data acknowledgement message.

47. (Currently Amended) The entity (501) according to claim 41, ~~characterized by comprising~~ wherein the entity further comprises a stopping device (518) arranged for stopping the keep alive timer when the ACL connection is disconnected during ~~[[a]]~~ the printing process.

48. (Currently Amended) The entity (501) according to claim 35, wherein a ~~new ACL connection is created to the printer after a break, characterized by comprising the~~ entity further comprises a requesting device (519) arranged for requesting a reconnection of a session defined by ~~[[the]]~~ a session identifier in a message sent to the printer server after a break in the ACL connection.

49. (Currently Amended) The entity (501) according to claim 48, wherein a ~~granted reconnection response message is received, characterized by comprising the entity~~ further comprises a continuing device (517) arranged for continuing the printing process in response to a granted reconnection response message by continuing to send print data request messages to the printer server ~~[[,]]~~ starting with the print data request message subsequent to ~~[[the]]~~ a last received print data acknowledgement message.

50. (Currently Amended) The entity (501) according to claim 35, ~~wherein all data to be printed is sent to the printer characterised by comprising~~ wherein the stopping device comprises a sending device (521) arranged for sending a message to the printer server, the message comprising a request to stop the print job ~~printjob~~.

51. (Currently Amended) The entity (501) according to claim 35, ~~characterized by comprising~~ wherein the closing device comprises a sending device (523) arranged for sending a message to the printer server, the message comprising a request to disconnect a session identified by a session identity.

52. (Currently Amended) The entity (501) according to claim 35, ~~characterized by comprising~~ wherein the entity further comprises a stopping device (524) arranged for stopping the sending of the keep alive messages after the closing of [[a]] the connection between the printer client and the printer server.

53. (Currently Amended) A printer entity ~~(601) included~~ in a ~~[[P]] printer~~ ~~(403)~~, the printer entity ~~(601) including~~ comprising:

a Bluetooth protocol stack comprising a Logical Link Control and Adaptation Protocol (L2CAP) ~~characterised in that the Bluetooth protocol stack further includes~~ and a wireless printer protocol, ~~said the wireless printer protocol comprising a printer server which communicates with a printer client, included in a processing unit; (402), by means of the wireless printer protocol,~~ ~~the Bluetooth protocol stack and air interface, the printer entity (601) further comprises:~~

a negotiating device ~~(605)~~ arranged for negotiating configuration parameters with ~~[[a]]~~ the printer client within the processing unit;

a sending device (609) arranged for sending keep alive messages frequently repeatedly to the printer client, the keep alive messages identifying whether a connection between the printer client and the printer server remains established;

a starting device ~~(612)~~ arranged for starting a print job;

a receiving device ~~(614)~~ arranged for receiving print data from the printer client; and

a stopping device ~~(620)~~ arranged for stopping the print job.

54. (Currently Amended) The printer entity ~~(601)~~ according to claim 53, ~~characterised in comprising~~ wherein the printer entity further comprises a responding device ~~(604)~~ arranged for responding ~~upon to~~ to a connection request ~~whether the connection is successful or not,~~ in a response message sent to the printer client regardless of whether the connection is successful.

55. (Currently Amended) The printer entity (601) according to claim 53, ~~characterised in comprising~~ wherein the negotiating device comprises a responding device (606) arranged for responding ~~upon~~ to a configuration request regardless of whether [[the]] configuration options in the configuration request are supported by the printer server ~~or not~~.

56. (Currently Amended) The printer entity (601) according to claim 53, ~~characterised in comprising~~ wherein the negotiating device comprises a loading device (607) arranged for loading a coding table sent from the printer client.

57. (Currently Amended) The printer entity (601) according claim 56, ~~characterised in comprising~~ wherein the negotiating device further comprises a sending device (608) arranged for sending a response ~~whether the loading of the coding table was successful or not~~ to the printer client regardless of whether the loading was successful.

58. (Currently Amended) The printer entity (601) according to claim 53, ~~characterised in that~~ wherein a keep alive timer (610) is implemented in the printer server.

59. (Currently Amended) The printer entity (601) according to claim 58, ~~characterised in comprising~~ wherein the printer entity further comprises a starting device (611) arranged for starting the keep alive timer each time a valid message is received from the ~~printer~~ processing unit.

60. (Currently Amended) The printer entity (601) according to claim 53, ~~characterised in comprising~~ wherein the starting device comprises a confirming device (613) arranged for confirming a start ~~printjob~~ print job request message sent ~~[[to]]~~ from the printer client.

61. (Currently Amended) The printer entity (601) according to claim 53, ~~characterised in comprising~~ wherein the receiving device comprises a sending device (615) arranged for sending an acknowledgement message to the printer client after receiving a ~~previous~~ decided predetermined number of print data request messages.

62. (Currently Amended) The printer entity (601) according to claim 53, ~~characterised in comprising~~ wherein the printer entity further comprises an indicating device (616) arranged for indicating, in a message sent to the printer client, that the printer is out of paper ~~; if the printer runs out of paper.~~

63. (Currently Amended) The printer entity (601) according to claim 53, ~~characterised in comprising~~ wherein the printer entity further comprises an indicating device (617) arranged for indicating, in a message sent to the printer client, that the printer is refilled with paper ~~; when the printer is refilled.~~

64. (Currently Amended) The printer entity (601) according to claim 53, ~~characterised in comprising~~ wherein the printer entity further comprises a stopping device (618) arranged for stopping ~~[[the]]~~ a keep alive timer when an asynchronous connection-less (ACL) connection to the processing unit is disconnected during ~~[[a]]~~ printing process.

65. (Currently Amended) The printer entity (601) according to claim 53, ~~characterised in comprising~~ wherein the printer entity further comprises a sending device (619) arranged for sending a response message to the printer client ~~[[,]]~~ according to whether a reconnection request is granted ~~or not~~.

66. (Currently Amended) The printer entity (601) according to claim 53, ~~characterised in comprising~~ wherein the stopping device comprises a sending device (621) arranged for sending a response message ~~[[,]]~~ comprising a confirmation after the printer server has received a request to stop the print job ~~printjob, the message comprising a confirmation that this is apprehended and is sent to the printer client.~~

67. (Currently Amended) The printer entity (601) according to claim 53, ~~characterised in comprising~~ wherein the printer entity further comprises a sending device (622) arranged for sending a response message to the printer client ~~[[,]]~~ according to whether a disconnection request is granted ~~or not~~.

68. (Currently Amended) The printer entity ~~(601)~~ according to claim 53, ~~characterised in comprising~~ wherein the printer entity further comprises a stopping device ~~(623)~~ arranged for stopping the sending of the keep alive messages after the connection to the printer client is closed.

69. (Currently Amended) [[C]] A communications system (401) characterised
by comprising:

a processing unit (501) according to claim 35; and

a printer entity (601) ~~including in~~ a [[P]] printer (403), the printer entity (601) ~~including~~
comprising:

a Bluetooth protocol stack comprising a Logical Link Control and Adaptation
Protocol (L2CAP) ~~characterised in that the Bluetooth protocol stack further includes~~ and a
wireless printer protocol, ~~said the wireless~~ printer protocol comprising a printer server which
communicates with a printer client, ~~included in [[a]] the processing unit; (402), by means of the~~
~~wireless printer protocol, the Bluetooth protocol stack and air interface, the printer entity (601)~~
~~further comprises~~:

a negotiating device (605) arranged for negotiating configuration parameters with
[[a]] the printer client within the processing unit;

a sending device (609) arranged for sending keep alive messages ~~frequently~~
repeatedly to the printer client, the keep alive messages identifying whether a connection
between the printer client and the printer server remains established;

a starting device (612) arranged for starting a print job;

a receiving device (614) arranged for receiving print data from the printer client;

and

a stopping device (620) arranged for stopping the print job.